

## WHAT IS CLAIMED IS:

- 1                   1.     A method for loading a disaccharide into mammalian nucleated cells,  
2     comprising:  
3                   contacting said cells for at least 2 hours with a solution comprising at least one  
4     disaccharide, thereby loading the cells with disaccharide to produce disaccharide-loaded  
5     mammalian nucleated cells.
- 1                   2.     A method of claim 1, wherein said cells are selected from the group  
2     consisting of stem cells, immune system cells, and epithelial cells.
- 1                   3.     A method of claim 1, wherein said contacting is for 10 hours.
- 1                   4.     A method of claim 1, wherein said contacting is for 24 hours.
- 1                   5.     A method of claim 1, wherein said disaccharide is trehalose.
- 1                   6.     A method of claim 1, wherein said solution further comprises not more  
2     than 3% dimethyl sulfoxide.
- 1                   7.     A method for increasing survival of mammalian nucleated cells  
2     following drying and rehydration, comprising:  
3                   (a) contacting said cells with a solution comprising at least one disaccharide  
4     for at least 2 hours, thereby producing disaccharide-loaded cells,  
5                   (b) drying said disaccharide-loaded cells to a residual water content between  
6     0.2 and 0.5 gram water per gram of dry weight, and  
7                   (c) rehydrating said cells,  
8     thereby increasing survival of the cells.
- 1                   8.     A method of claim 7, wherein said contacting is for 24 hours.
- 1                   9.     A method of claim 7, wherein said cells are selected from the group  
2     consisting of stem cells, immune system cells, and epithelial cells.
- 1                   10.    A method of claim 7, wherein said disaccharide is trehalose.
- 1                   11.    A method of claim 7, wherein said cells further comprise a heat shock  
2     protein.

1                   12.    A method of claim 11, wherein said heat shock protein is induced by  
2    exposing said cells to a heat shock.

1                   13.    A method of claim 12, wherein said heat shock consists of raising the  
2    temperature of medium contacting the cells to 42 - 44 °C for one hour, and then allowing the  
3    temperature of the medium to drop to 36- 38 °C.

1                   14.    A method of claim 11, wherein said heat shock protein is introduced  
2    into the cells by contacting said cells with a solution comprising said protein.

1                   15.    A method of claim 11, wherein said heat shock protein is expressed  
2    from a nucleic acid sequence introduced into said cells.

1                   16.    A method of claim 11, wherein said heat shock protein is p26 from  
2    *Artemia franciscana*.

1                   17.    A method of claim 7, further wherein said cells are contacted with a  
2    solution comprising an apoptosis inhibitor.

1                   18.    A method of claim 17, wherein said apoptosis inhibitor is selected  
2    from the group consisting of N-(2-Quinolyl)valyl-aspartyl-(2,6-difluorophenoxy)methyl  
3    ketone (in which the aspartyl residue is o-methylated or non-o-methylated), caspase I  
4    inhibitor II, calpain inhibitor, and Bcl-xL.

1                   19.    A method of claim 7, further wherein said cells are contacted by a  
2    solution comprising arbutin or hydroquinone, provided that said cells are not 293 cells or B  
3    cells.

1                   20.    A method of claim 7, further wherein said cells are contacted by a  
2    solution comprising not more than 3% dimethyl sulfoxide.

1                   21.    A method of claim 7, further wherein said cells are contacted by a  
2    solution comprising a heat shock protein and an apoptosis inhibitor.

1                   22.    A method of claim 21, wherein said solution further comprises not  
2    more than 3% dimethyl sulfoxide.

1                   23.    A method of claim 19, wherein said cells are dried in a medium  
2   comprising arbutin or hydroquinone.

1                   24.    A method of claim 7, wherein said cells are dried in rounded droplets  
2   of drying buffer.

1                   25.    A method for increasing survival of mammalian nucleated cells  
2   following drying and rehydration, comprising:  
3                   (a) contacting said cells with a solution comprising an apoptosis inhibitor,  
4   thereby loading the cells with said apoptosis inhibitor, to produce apoptosis inhibitor -loaded  
5   cells,  
6                   (b) drying said apoptosis inhibitor-loaded cells, and  
7                   (c) rehydrating said cells,  
8   thereby increasing survival of the cells.

1                   26.    A method of claim 25, wherein said apoptosis inhibitor is selected  
2   from the group consisting of N-(2-Quinolyl)valyl-aspartyl-(2,6-difluorophenoxy)methyl  
3   ketone (in which the aspartyl residue is o-methylated or non-o-methylated), Caspase I  
4   inhibitor II, Calpain inhibitor, and Bcl-xL.

1                   27.    A method of claim 25, wherein said cells are selected from the group  
2   consisting of stem cells, immune system cells, and epithelial cells

1                   28.    A method of claim 25, wherein said cells are dried in droplets of  
2   drying buffer.

1                   29.    A method for increasing survival of mammalian nucleated cells  
2   following drying and rehydration, comprising:  
3                   (a) introducing a heat shock protein into, or inducing production of a heat  
4   shock protein in, said cells, to produce heat shock protein-loaded cells,  
5                   (b) drying said heat shock protein-loaded cells, and  
6                   (c) rehydrating said cells,  
7   thereby increasing survival of the cells.

1                   30.    A method of claim 29, wherein said heat shock protein is p26 from  
2   *Artemia franciscana*.

1           31.    A method of claim 29, wherein said heat shock protein is introduced  
2 into said cells by incubating said cells in a medium comprising said heat shock protein.

1           32.    A method of claim 29, wherein said heat shock protein is induced in  
2 said cells by raising the temperature of medium contacting the cells to 42 - 44 °C for one  
3 hour, and then allowing the temperature of the medium to lower to 36- 38 °C.

1           33.    A method of claim 29, wherein said heat shock protein is introduced  
2 into said cells by introducing into said cells a nucleic acid sequence comprising a promoter  
3 operably linked to a sequence encoding said heat shock protein.

1           34.    A method of claim 29, wherein said cells are selected from the group  
2 consisting of stem cells, immune system cells, and epithelial cells.

1           35.    A method of claim 29, wherein said cells are dried in droplets of  
2 drying buffer.

1           36.    A method for increasing survival of mammalian nucleated cells  
2 following drying and rehydration, provided said cells are not 293 cells or B cells, comprising:  
3           (a) incubating said cells with a compound selected from arbutin and  
4 hydroquinone, to produce arbutin- or hydroquinone- loaded cells,  
5           (b) drying said arbutin- or hydroquinone- loaded cells, and  
6           (c) rehydrating said cells,  
7 thereby increasing survival of the cells.

1           37.    A method of claim 36, wherein said compound of step (a) is arbutin.

1           38.    An isolated mammalian nucleated cell comprising a disaccharide and a  
2 compound selected from the group consisting of arbutin and hydroquinone.

1           39.    An isolated mammalian nucleated cell of claim 38, wherein said  
2 compound is arbutin.

1           40.    A mammalian nucleated cell of claim 38, wherein said cell is dried.

1           41.    A mammalian nucleated cell of claim 38, further comprising an  
2 apoptosis inhibitor.

1                    42.    A mammalian nucleated cell of claim 38, further comprising a heat  
2 shock protein.

1                    43.    A mammalian nucleated cell of claim 38, wherein said disaccharide is  
2 trehalose.

1                    44.    An isolated dried mammalian nucleated cell comprising a disaccharide  
2 and an exogenous heat shock protein.

1                    45.    A dried mammalian nucleated cell of claim 44, wherein said  
2 disaccharide is trehalose.

1                    46.    A isolated, dried mammalian nucleated cell comprising a disaccharide  
2 and an exogenous apoptosis inhibitor.

1                    47.    A dried mammalian nucleated cell of claim 46, wherein said  
2 disaccharide is trehalose.